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Special Issue

Review Article

Nutrition in contemporary Zimbabwe: a situational analysis

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Abstract

Background: Malnutrition in all its forms continues to be a global public health challenge affecting mostly women and children in Africa. The socioeconomic consequences of poor nutrition are far-reaching and cross-generational. **Objective:** To provide an update on the nutrition situation in Zimbabwe in the context of the United Nations 2030 sustainable development agenda. **Key findings:** In Zimbabwe, the leading nutrition problems include high levels of childhood stunting, micronutrient deficiencies (Vitamin A, Iron, Zinc, and Selenium) affecting mostly children younger than 5 years and women aged 15-49 years. This paper presents evidence on the emergence of obesity and associated complications like diabetes, hypertension, and several cancers in addition to the traditional problem of undernutrition burden "multiple burden of malnutrition". These nutrition challenges can be attributed to poor breastfeeding and infant and young child feeding (IYCF) practices, the low dietary diversity affecting mostly rural households and nutrition transition. Cultural and religious beliefs are barriers to the adoption of appropriate breastfeeding and IYCF practices. **Conclusion:** The multiple burden of malnutrition exists in Zimbabwe. Although there is political, commitment and multisectoral initiatives to address malnutrition and food insecurity, the declining socio-economic situation and the COVID-19 associated restrictions are worsening the situation and poor households are getting more vulnerable. Considering that Zimbabwe's economy is agriculture-based there is a need to put emphasis on promoting nutrition-sensitive agriculture initiatives and urgently implement the Food-Based Dietary Guidelines (FBDGs) to propel the adoption of healthy lifestyles and dietary behaviors.

Keywords: Stunting, Breastfeeding, IYCF, Micronutrient deficiency, SDGs, COVID-19, Zimbabwe.

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1. Introduction and background

In Africa the prevalence of undernutrition is high, and in spite of several interventions, there is little, if any, evidence of meaningful improvement in the nutritional status indicators of women and children [1,2]. Multiple burden of malnutrition is one of the most critical problems in low- and middle-income countries (LMICs)[3,4]. Unfortunately, most interventions in LMICs are still biased toward fighting undernutrition. It is critical that governments identify the shared drivers of the double burden of malnutrition in order to establish an effective response that simultaneously addresses malnutrition in all its forms in line with the 2030 Sustainable Development Goals (SDGs) agenda [4].

In Zimbabwe, the leading nutrition problems include high levels of childhood stunting, micronutrient deficiencies (Vitamin A, Iron, Zinc, and Selenium), and an emerging problem of obesity and its associated complications like diabetes, hypertension, and several cancers "diet related noncommunicable diseases" [5-7]. The globesity and growing non-communicable diseases (NCDs) burden in LMICs can be attributed to the process of nutrition transition, characterized by decreasing physical activity levels and increased consumption of energy-dense foods that are often highly processed [8]. Therefore, the national governments should create a supportive environment to address malnutrition in all its forms utilizing a multisectoral approach. Although Zimbabwe has several policies, strategies, and programs in place to try and address the fundamental food and nutrition security problems, programs that deal with perennial poverty and food insecurity should be strengthened so as to address these key underlying causes of the multiple burden of malnutrition in the country. The launching of the Food-based Dietary Guidelines (FBDGs) for Zimbabwe that are currently being developed will be a useful tool to help increase physical activity and adopt healthy eating behaviors and lifestyles in communities [9].

All these important actions and policy decisions by the Government of Zimbabwe (GoZ) should be matched with financial commitment and adequate budgetary allocation for nutrition programs. According to a paper in the Lancet Global Health, there is a need for direct financial investments towards improving the nutritional status of children in low- and middle-income countries (LMICs)[10]. Investment in nutrition is therefore crucial to breaking the intergenerational cycle of malnutrition [1,2]. The current review is designed to provide an update on the nutrition situation in Zimbabwe in the context of the United Nations 2030 sustainable development goals (SDGs) framework.

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1.1. The socio-demographic characteristics for Zimbabwe

Zimbabwe attained its independence in 1980 and based on the 2012 national census the population size was approximately 13 million people consisting of marginally more females (52%) than males [11]. A high proportion of the population consists of young people below 15 years of age (41%), and the average household size is 4.2 persons [11]. In addition, a high proportion of the population resides in rural areas (67%), and in general, the country has a high literacy rate (96%).

Zimbabwe is a low-income country, ranked 150 out of 189 on the 2019 United Nations Development Programme (UNDP) Human Development Index [12]. Life expectancy at birth for men and women was 56 and 60 years, respectively. The infant mortality rate was estimated at 64 deaths per 1000 births for 2012. The rate was generally higher for males than for females. The under-five mortality rate was 84 per 1000 live births [11].

In the past 15 years, Zimbabwe has experienced a humanitarian, economic, and social crisis that has been characterized by an increase in poverty and food insecurity [13,14]. The nation has experienced food shortages since the 1990s at both the national and household levels [14]. This has a huge impact on children as they become more susceptible to disease, suffer cognitive impairment, have poorer educational outcomes, poor growth and have reduced economic productivity as adults.

1.2. Main natural and economic resources in Zimbabwe

Zimbabwe's economy is mainly based on agricultural production activities [15]. In 2000, GoZ initiated the infamous land redistribution program aimed at correcting colonial-era injustices regarding land ownership and food sustainability [16]. In addition, the country holds substantial natural resources with approximately 40 different minerals including chromite, coal, asbestos, copper, nickel, gold, platinum, and iron ore. The Gross Domestic Product (GDP) of Zimbabwe is mainly made of agriculture (12%), mining, manufacturing, energy production, construction industry (22.2%), and services industry (65.8%) [17]. Although currently, Zimbabwe's economy is still deeply repressed, its GDP expanded by an average of 2.6% over the past five years, but a severe contraction was projected in 2020 due to persistent drought that compromises agricultural output and energy production [17].

Consequently, the COVID-19 pandemic is worsening the inherent structural weaknesses. This deepening economic crisis has resulted in the shortage of essential goods, as well as sharp decline in real wages amid soaring inflation, highlighting the risk of wider political instability and heightened food insecurity.

1.3. Key stakeholders involved in nutrition and public health landscape in Zimbabwe

In 2013, the GoZ launched the Food and Nutrition Security Policy (FNSP) and the national nutrition strategy (2014-2018) which provided a holistic framework to address the challenges of malnutrition in a multi-sectoral manner. This ensures that there is participation and involvement of various stakeholders through the multisectoral food and nutrition security committees at national, provincial, district, ward, and village levels and coordinated by the Food and Nutrition Council (FNC). The summary of the stakeholders involved in nutrition activities in Zimbabwe consists of:

- FNC is responsible for policy coordination, monitoring, and advisory support;
- The 17 sector ministries that implement specific aspects of the national nutrition strategy;
- United Nations (UN) agencies;
- Research and academia
- Civil society organizations;
- The private sector, bilateral and multilateral funding agencies.

Subsequently, the beneficiary communities and individuals are also important stakeholders in the implementation of nutrition programs. Overall, there is a weak implementation of policies and implementation plans due to limited funding, therefore robust monitoring and evaluation for improved accountability is pertinent.

1.4. Progress in the achievement of Sustainable Development Goals (SDGs)

Nutrition is centrally positioned within the 2030 SDGs framework, with SDG #2 being linked to all other goals. Therefore, good nutrition is both an input and outcome for the attainment of the SDGs by 2030 [18]. Thus the 17 SDGs present an opportunity to end hunger and food insecurity though nutrition sensitive agriculture initiatives (SDG #2). This calls for commitment by GoZ to comprehensive, integrated, and universal transformations for sustainable positive nutrition outcomes. According to the 2019 Scaling Up Nutrition progress report, the Zimbabwe's progress towards scaling-up nutrition stood at 80%, broken down to Bringing people together (96%), Coherent policy and legal framework (85%), Aligning programs around a Common Results Framework (77%), and Financial tracking and resource mobilization (61%) [19]. This clearly shows that there is still much to be done.

In Zimbabwe, stunting among children under-five years old has remained the leading form of malnutrition with the following prevalence's from national surveys 33.8% in 2010 [20], 27% in 2015 [21], and 26.2% in 2018 [22]. Therefore, it is important that the prevalence trends are monitored for the drafting of appropriate policies and strategies to address malnutrition in all its forms in vulnerable communities. The understanding of malnutrition dynamics in Zimbabwe will help with efficient resource utilization and prioritization of evidence-based interventions to catapult socio-economic development. Although, the country has several policies and supportive

institutional framework that directly or indirectly impact food and nutrition the following concerns are noted:

- Most programming is targeting children younger than five years and women aged 15-49 years with less focus on school age children and adolescents;
- There is a bias towards addressing undernutrition that is predominant in rural areas;
- Less emphasis is given to the emerging problem of over-nutrition and noncommunicable diseases;
- There is need to improve funding and coordination of the multisectoral response in order to achieve the SDGs by 2030.

2. Summary of the evidence on the nutrition situation in Zimbabwe

2.1. Food environment and food systems in Zimbabwe

Food environments are defined as all the foods that are available and accessible to people in the settings in which they go about their daily lives [23], while food systems encompass the entire range of activities, peoples, and institutions involved in the production, processing, marketing, consumption, and disposal of food [24]. Food environments are influenced by the food systems which supply them and vice versa. Traditionally, the majority of Zimbabweans stay in rural areas (63%), where agriculture is the main income-generating activity for 51.8% of households [25]. Smallholder agriculture in Zimbabwe is predominantly focused on staple maize production, while, in urban areas, they buy their food from supermarkets and informal markets or street food vendors [26]. To ensure household food security the focus on nutrition-sensitive agriculture is recommended based on the growing evidence of its contribution to improved nutrition outcomes in low-income countries [2,27]. In addition, recently launched innovations like biofortified provitamin A orange maize and iron-rich beans have the potential to address micronutrient deficiencies in rural Zimbabwe [28].

2.2. Food security in the Zimbabwean context

The 2019 Rural Livelihoods Assessment (RLA) conducted by the Zimbabwe Vulnerability Assessment Committee (ZimVAC) projected that 59% of the rural population were cereal insecure in the period January to March 2020, this translated to approximately 5.5 million people [15]. Whereas the 2019 urban livelihoods assessment (ULA) showed 29.9% (approximately 2.2 million people) of urban households were food insecure in the same period [29]. These figures show a glaring picture of food insecurity that requires timely and targeted food distribution or cash-based transfers (to promote the local economy where feasible) to food-insecure households in order to avoid a worsening situation, in the context of COVID-19 (Coronavirus) pandemic.

Although we know a lot from the annual vulnerability assessment surveys, there are still grey areas regarding the underlying drivers of food insecurity within the Zimbabwean context. Very few studies have attempted to explore the determinants of food insecurity. The 2015 Zimbabwe Demographic and Health Survey (ZDHS) revealed that the lack of diverse nutritious foods in rural diets contributes to the higher rates of under-nutrition in vulnerable groups [21]. The consumption of over-processed and energy-dense foods in urban areas is linked to the increased overweight and obesity prevalence particularly amongst children and women [21]. Therefore, there is a mismatch between consumption patterns and agriculture-related policies and nutrition programs. The 2020 global nutrition report showed that the recurrent key drivers of food insecurity in Zimbabwe include poverty, HIV/AIDS, limited employment opportunities, liquidity challenges, recurrent climate-induced shocks, and economic instability [30].

The understanding of the key drivers of food insecurity is critical for sustainable action towards the 2030 SDG agenda, particularly "Zero hunger" SDG #2. The 2015 Zero hunger strategic review of the food security situation in Zimbabwe, highlighted the need for more engagement and increased financial and technical support from development partners [31].

The 2019 ZimVAC rural and urban livelihoods assessments revealed that on average each household consumes two meals a day. There appear to be stronger efforts to protect younger children in poorer households than in wealthier households [32].

The use of non-timber forest products (NTFPs) and/or neglected and underutilized food species (NUS) to improve dietary diversification and food security is well documented [33-35]. While Zimbabwe is rich in traditional and indigenous foods, little research has been undertaken to explore the contribution of NTFPs and NUS in meeting the household's daily micronutrient requirements and food security.

2.3. Mandatory commercial food fortification

There is a lack of data on consumption patterns for Zimbabweans across the life cycle. A paper that explored the influence of context and culture on nutrient intakes and complementary feeding practices of 6 to 12-month-old infants in sub-Saharan Africa highlighted the major nutrient gaps in Zimbabwe being a protein, vitamin A, folate, iron, and zinc mainly affecting women and young children [36]. This is closely linked to low consumption of animal source foods, legumes, fruits, or vegetables. The 2012 micronutrient survey also revealed high levels of vitamin A and iron deficiency among children as well as women of childbearing age an indication of poor dietary intake [5]. In response the GoZ launched the National Food Fortification Strategy (2014-2018) in 2015. This fortification strategy which was aligned with the National

Nutrition Strategy was aimed at addressing the micronutrient deficiency burden for Zimbabwe.

Consequently, in 2017, the GoZ through the Statutory Instrument 120 of 2016: Food Fortification Regulations rolled out the mandatory fortification of processed staple foods with micronutrients focusing on four vehicles; maize meal and wheat flour (A, B1, B2, B3, B6, B12, folic acid, iron, and zinc), cooking oil (vitamin A and D), and sugar (vitamin A) [37,38]. In addition to commercial fortification which benefits mostly urban communities, the country is also promoting the increased production and consumption of two key biofortified crops: Vitamin A rich orange maize, high iron beans (NUA 45) targeting rural subsistence farmers [28]. A study that explored the impact of food fortification on stunting in Zimbabwe found that the mandatory commercial fortification of staple foods has the potential to reduce the proportion of stunted children aged 0-59 months [39]. Generally, in Zimbabwe, cultural and traditional beliefs, food myths, and religious prohibitions influence food consumption patterns of different population groups and in most cases negatively.

2.4. Evolving consumption patterns in Zimbabwe

In the 2013 Global Burden of Disease (GBD), poor dietary habits were the second leading risk factor for mortality globally, accounting for nearly one in every five deaths [40]. The 2019 ZimVAC RLA reported that 47% of the households were consuming an acceptable diet (defined as Food Consumption score >35), 24% were consuming poor diets and 29% had borderline or moderately poor diets in rural Zimbabwe [15]. Out of the 60 rural districts, 8 had greater than 50% of its households having poor food consumption patterns of which Chipinge (66%) and Mudzi (65%) districts had the highest. The urban households appeared to have better food security compared to the rural counterparts, where 62% of the households consumed acceptable diets and 21% and 17% having poor and borderline poor diets [29].

The 2018 NNS report showed that the proportion of households consuming Vitamin A rich foods seven days prior to the survey was 92%, protein-rich foods was 78% and households consuming iron-rich foods was 63% [22]. The 2019 RLA survey showed that only 8% of the households were consuming iron-rich foods daily whilst 65% were consuming vitamin A rich foods daily [15]. The proportion of households that never consumed any protein-rich foods daily in the seven days prior to the survey was 31% nationally, with Matabeleland North and Manicaland having the highest proportion (37%). Urban areas also performed better compared to rural communities, regarding daily consumption of iron (26.7%), vitamin A (71.7%), and protein (46.1%) rich foods.

The 2017 food expenditure and consumption patterns report also revealed emerging trends in unhealthy dietary habits, especially in rural areas, with increased consumption of high caloric foods like biscuits and fizzy drinks [41]. Although maize still accounts for the largest share of household expenditures, there is evidence of dietary transformation towards other staples such as rice, wheat, pasta, and potatoes (Table 1).

In summary, studies that explore the determinants of food choices are urgently needed in Zimbabwe, to inform social behavior change communication (SBCC) interventions. This is a critical preventive strategy hinged on empowering communities to adopt healthy nutrition-related behaviors [42]. Thus, FBDGs which are at the final stages of development, have the potential to promote good nutrition, healthy eating, and physical activity [9]. Furthermore, the agricultural production policies in Zimbabwe may be failing to keep pace with the changing food consumption patterns in both urban and rural areas as they have remained maize-centric.

2.5. Dietary diversification and diet quality

Overall, when comparing rural and urban households, there is a relatively higher proportion of households achieving acceptable dietary diversity (consumption of at least 5 food groups) in urban areas than rural settings. The NNS 2018 report shows that the current national average Household Dietary Diversity Score (HDDS) was 5 food groups out of the possible 12 [22]. The 2019 ZimVAC survey showed that among sampled rural households 25.9% were food insecure, and bigger proportions of insecure households were from Matabeleland North (44.5 %), Matabeleland South (27.9 %), and Mashonaland West (26.3 %) provinces [15]. In 2018, a greater proportion of the households consumed cereals followed by vegetables, fruits, and meats while meat, dairy products, pulses, and eggs were the least consumed [22]. In 2018, based on the minimum dietary diversity for women (MDD-W) indicator, 44% of women aged 15-49 years consumed at least a minimum of 5 food groups [22], compared to 43% in the ZimVAC 2019 RLA [15]. So, less than half of women of reproductive age are consuming diverse and nutritious foods to meet their daily micronutrient requirements.

2.6. Micronutrient deficiencies

National micronutrient surveys have not been conducted on a regular basis for various reasons chiefly high-cost input required. Furthermore, there has not been consensus for the inclusion of direct indicators of status (e.g. biomarkers of Fe, I, Se, Zn, and vitamin A status) in the demographic health surveys compounded by gaps in research capacity. Zimbabwe has conducted 3 national micronutrient surveys to date with the latest being conducted in 2012 [5].

Table 1: Proportion of food budgets spent on each commodity group by rural and urban total

Food Commodity	National (%)			Rural (%)			Urban (%)		
	1996	2001	2011	1996	2001	2011	1996	2001	2011
Maize	21.2	15.8	14.8	25.9	18.6	16.1	14.6	10.8	9.6
Rice	1.2	1.5	0.1	0.8	1.1	0.1	1.7	2.3	0.3
Wheat	11.5	11.2	10.8	6.9	6.7	9.4	17.7	19.4	16.3
Other cereals	0.5	0.5	1.4	0.5	0.4	1.7	0.4	0.6	0.4
Potatoes	1.1	1.2	1.9	0.6	0.7	2.1	1.7	2.2	0.9
Tubers	0.0	0.1	4.8	0.0	0.1	4.9	0.0	0.1	4.3
Pulses	1.7	2.1	5.8	2.3	2.6	6.7	0.9	1.1	2.6
Vegetable oils and animal fats	6.3	6.3	1.0	5.6	6.0	1.1	7.2	6.9	0.9
Vegetables	11.8	13.9	19.8	14.2	16.4	21.8	8.4	9.5	11.8
Fruits	1.2	1.4	2.6	1.3	1.5	2.9	1.1	1.2	1.1
Beef	8.7	9.0	0.4	5.1	5.9	0.2	13.6	14.5	1.0
Other meats	1.7	1.5	5.3	1.6	1.4	4.2	1.8	1.6	9.6
Fish Products	3.9	4.1	4.6	4.4	4.8	4.4	3.3	2.9	5.4
Dairy Products	3.9	3.4	1.7	2.1	1.9	1.3	6.3	6.2	2.9
Poultry	2.5	2.6	0.3	2.1	2.1	0.3	3.0	3.5	0.2
Eggs	1.0	1.0	1.8	0.5	0.6	2.3	1.8	1.9	0.1
Sugar and Sweets	6.8	6.4	1.2	7.9	7.3	1.3	5.3	4.9	0.9
Spices	1.0	1.3	0.5	1.0	1.4	0.4	1.1	1.0	1.1
Non-alcoholic beverages	2.7	2.8	0.3	1.8	2.0	0.2	3.8	4.2	0.6
Alcoholic beverages	1.8	1.8	0.6	1.4	1.7	0.6	2.3	2.0	0.5
Food consumed away from home	0.2	0.5	3.1	0.0	0.2	2.3	0.3	0.9	6.3
All other foods	9.5	11.6	17.3	13.8	16.7	15.7	3.4	2.5	23.2

Source: ZIMSTAT PICES studies (1996, 2001, 2011) [58].
Notes: Other meats include pork, goat meat, mutton, and game meat; Other cereals include sorghum and millet

Vitamin A deficiency (VAD): According to the 2012 national micronutrient survey, the overall prevalence of VAD as measured by retinol-binding protein of less than 0.825 µmol/L among the children 6-59 months was 21%. It was higher in children living in rural areas (24%) as compared to those living in urban areas (9%). It was also higher among girls (20%) compared to boys (18%). Concerning women (15-49yrs), 24% were vitamin A deficient. VAD was more prevalent in women living in rural areas (27%) compared to 18% in urban areas [5].

Iron (Fe): Iron deficiency is high in Zimbabwe. Seventy-two (72%) of the children aged 6 – 59 months were iron deficient (low plasma ferritin). The prevalence was 61% among women aged 15 to 49 years. The prevalence of iron deficiency in women was higher in urban areas (65%) compared to the rural areas (58%)[5].

Anemia: More than a third of children aged 6-59 months (37%) are anemic (Hb<11.0g/dL). The prevalence of anemia is similar for children in urban and rural areas (38% and 37%, respectively). There is also little difference by gender; 38% of boys are anemic compared with 36% of girls. The prevalence of anemia in children age 6-59 months has however decreased over the years from 2005-06 (58%) to 37% in 2015 [21]. While 27% of women and 15% of men age 15-49 are anemic according to the ZDHS of 2015 [21]. Women living in urban areas (29%) are slightly more likely to be anemic than their counterparts in rural areas (26%). In contrast, men in rural areas are more likely to be anemic than their counterparts in urban areas (17% and 11%, respectively). In a more recent survey, the proportion of pregnant women with any form of anemia was 33.1% [43].

Iodine: In Zimbabwe, the Iodine Deficiency Disorder (IDD) sentinel surveillance is conducted every two (2) years to assess the change in iodine status and level of salt iodization as recommended by UNICEF/WHO guidelines [44]. The 2018 national survey revealed a national median value of 118µg/l in the target (children 6-12 years). The median urinary iodine for boys was higher (135.5 µg/l) as compared to 124 µg/l for girls. IDDs are a problem in populations with median urinary iodine of less than 100 µg/I. The proportions of children with urinary

iodine levels below 100 µg/I was 41.9%. Though this current prevalence is less than 50% the WHO recommended value, this is still a cause for concern. Only 6% had urinary iodine concentration of above 300ug/L which may indicate excess iodine intake.

The median urinary iodine concentration in children 6-12 years has however remained in an acceptable range over the years. Concerning pregnant women surveyed, more than half of pregnant women (60.3%) had urinary iodine levels below 150 µg/I indicating that majority of the pregnant women in Zimbabwe are not consuming adequate iodine and only 1% had excess urinary iodine levels above the WHO value of >500ug/L.

2.7. Non-Communicable Diseases (NCDs) burden

Available evidence shows a sustained increase in the prevalence of NCDs in Zimbabwe with both prevalence and risk factors consistently higher in females than males. NCDs are estimated to account for 33% of all deaths in Zimbabwe [6].

In an analysis of cancer registry data, in a population of 16.913.263, there were 17 465 new cases (11007 females and 6458 males) and total prevalence (5-year prevalence) was 30 204[7,45]. The most frequently occurring cancers among Zimbabweans were cervix uteri (18.2%), breast (10.8%), Kaposi sarcoma (KS) (9%), prostate (7.4%), non-Hodgkin lymphoma (NHL) (6.3%), and esophagus (5.3%).

The leading causes of cancer among Zimbabwean black men were prostate cancer (20.1%), followed by KS (15.2%), NHL (7.5%), esophagus (6.3%), and colorectum (5.9%). In women, the leading causes of cancer were cervix uteri (28.9%) followed by breast (17.1%), NHL (5.6 %), KS (5.3%), and esophagus (4.7%)[45]. The mean ages of cancer patients diagnosed among Zimbabweans of all races in 2015 were 56.8 and 52.8 for males and females, respectively [7].

While no data is available for metabolic syndrome a review on cardiometabolic disease (CMD) which encompasses cardiovascular disease, diabetes, and metabolic syndrome showed that the CMD mortality rate has increased by 29.4% during the review period (1996-2007) [46] accounting for 8.3% of all deaths in that period. Overall, females have a 1.65% higher mortality than males. CMD mortality is predicted to increase from 9.6% in 2015 to 13.7% in 2040 for males, and from 11.6% in 2015 to 16.2 % in 2040 for females [46]. Type 2 diabetes has increased from 0.4% before 1980 [47] to 4.6% in 2016 [48]. It is estimated to be higher in females (5.2%) compared to males (4.0%). The same trend has been observed for overweight and obesity prevalence. Overweight prevalence is 26.2% (males 13.7 and females 38.4). Obesity prevalence is 8.4% (males 1.9%) and (females 14.8%)[21,48].

2.8. Adolescent nutrition "The neglected age group"

Adolescence is a period characterized by rapid growth that is second to the first 1000 days of a child`s life. Although there is very limited data on adolescent nutrition indicators in Zimbabwe, there appears to be a trend indicating the presence of "multiple burden of malnutrition" particularly anemia, undernutrition, and obesity among adolescents. According to the 2015 ZDHS report, the prevalence of any anemia among girls and boys aged 15-19 years by residence was; rural boys (25.2%), urban boys (27.1%), rural girls (22.3%), and urban girls (14.8%) [21].

A recent study among primary school children aged 9-14 years, revealed that overweight was the leading form of malnutrition, coexisting with undernutrition "double burden of malnutrition". Specifically, overweight, wasting, and stunting affected 25.8%, 6.3%, and 3% of the learners, respectively [49]. Therefore, comprehensive and multi-sectoral interventions to improve healthy eating and physical activity are warranted. A landscape analysis on the readiness to accelerate adolescent nutrition programming that was conducted in 2019 revealed that there is an enabling policy and institutional framework for scaling up adolescent nutrition programming in Zimbabwe [50]. In addition, the researchers observed that the lack of nationally representative data for the age groups 10-19 years is a barrier for scaling up focused adolescent nutrition programs.

Most of the data available for this age group is subnational and dealing with adolescent sexual and reproductive health indicators (ASRH).

2.9. Nutritional status of children aged 0-59 months

The 2018 National Nutrition Survey reported the average proportion of babies born with low birth weight was at 20% [22]. The highest proportion was from the capital city Harare with a prevalence of 36%.

Underweight prevalence is 8.8% with boys (9.6%) being worse off than girls (8%). Though stunting has been on a general decline over the years, the prevalence is still above, the threshold of 20% which deems it a problem of public health significance [51]. The current prevalence is 26.2% and the same trend is observed where prevalence is higher in boys (28.5%) than girls (23.9%). Wasting prevalence is 2.5% (boys 2.7% and girls 2.3%). Overweight prevalence was 2.6% (boys 2.7% and girls 2.5%). There was a general decline in all indicators from 2010 levels except wasting which has increased from 2.1% to 2.5% [51].

2.10. Breastfeeding, Infant, and young child feeding (IYCF) practices

Low breastfeeding and poor feeding practices increase the risk of nutrient deficiencies among infants and young children. Overall, in Zimbabwe, there is poor Infant and young child feeding (IYCF) practices. The 2018 NNS survey revealed that early initiation of breastfeeding rate was 69% while exclusive breastfeeding was practiced by 61% of the mothers [22]. In addition, continued breastfeeding at 1 year (12-15 months) was practiced by 83% and continued breastfeeding at 2 years (20-23 months) by 10.8% of the children [22]. Although, the EBF rate of 61% had surpassed the 50% World Health Assembly (WHA) 2025 target, misconceptions, myths, traditional beliefs, and practices such as

perceived insufficient breast milk production and early introduction of solids, mixed, and inconsistent messages regarding HIV/AIDS and breastfeeding still exist that interfere with breastfeeding [52].

Regarding complementary feeding, the 2018 NNS report revealed that only 4% of children received a minimum acceptable diet (MAD) with inter-province variances, only 16% of children 6- 23 months had dietary diversity scores (DDS) ≥4 food groups in the 24 hours preceding the survey and only 19% of the children 6-23 months received the recommended minimal meal frequency (MMF) [22]. The NNS of 2018 also observed poor infant feeding practices and early introduction of complementary foods, giving pre-lacteal feeds and poor dietary diversity [22]. Poverty and food insecurity are the key drivers of poor IYCF in Zimbabwe. In addition, traditional and religious beliefs and taboos are also leading barriers to the adoption of appropriate IYCF among Zimbabwean women [52]. For example, the influence of husbands and grandmothers on pregnant and lactating women is strongly hinged on cultural nuances.

A 2012 food security analysis report showed that traditional feeding practices in Zimbabwe discourage the consumption of high-quality sources of protein among infants and young children [53]. Furthermore, mothers are hesitant to feed vegetables, meat, hard cereals, some beans, traditional insects, and hard fruits because of the worry that the baby may choke [36]. As a recommendation, nutrition education messages targeting pregnant and lactating women in the antenatal and postnatal care sessions should focus on addressing these identified socio-cultural barriers to the adoption of appropriate breastfeeding and IYCF practices.

2.11. Crosscutting issues

The nutrition situation analysis for Zimbabwe cannot be concluded without mentioning some key cross-cutting issues that build on the synergies of the sustainable development goals (SDGs) these include:

a. Gender and equality in nutrition,
b. Climate change and nutrition-sensitive agriculture,
c. The impacts of COVID-19 on food and nutrition security in Zimbabwe.

2.11.1. Gender equality and nutrition

Although gender discrimination can affect boys and men, it disproportionately affects more girls and women. For example, the Gender Parity Index (GPI), a ratio of female to male attendance rates at the primary and secondary levels that indicates the magnitude of the gender gap, where a GPI lower than 1 indicates a gender disparity in favor of males. The 2015 ZDHS reported that at the primary school level, the GPIs for the net attendance ratio (NAR) and gross attendance ratio (GAR) were 1.01 and 0.96, respectively [21]. While at the secondary school level, the GPIs for the NAR and GAR were 1.03 and 1.02, respectively [21]. This indicates that there is relatively little difference in overall school attendance by girls and boys at either the primary or secondary school level. The 2019 rural livelihoods assessment report showed that the proportion of children who were out of school constituted 55% males and 45% females [15].

The 2015 ZDHS report further revealed that 55% of currently married women age 15-49 are employed compared to 90% of currently married men. In 2015, regarding spousal violence, 35% of ever-married Zimbabwean women aged 15-49 years had experienced physical or sexual violence from a spouse, and of these women, 37% reported experiencing physical injuries [21]. Therefore, it is important to note that gender research and gender empowerment, particularly through the increased participation of women in extension services and activities, are recommended components in development initiatives toward achieving gender equality, food security, and improved health in rural populations [54]. As such Zimbabwe will not achieve the UN 2030 SDGs targets in the absence of gender equality. Therefore, considering that the economy of Zimbabwe is agriculture-based with the majority of the population residing in rural areas as subsistence farmers, there is a need to strengthen policies and gender empowerment strategies by GoZ and implementing partners to improve women's access to agricultural technologies and services.

2.11.2. Climate change and nutrition-sensitive agriculture

Nutrition is an input to and an outcome of strengthened resilience. There is evidence that climate change is having impacts on agriculture production in Zimbabwe [55-56]. This has implications for household food security and given that most of the smallholder farmers are vulnerable, there is a need for research and development of labor-saving technologies to increase resilience to climate change. Therefore, it is important that the GoZ institutes programs that link food and agriculture interventions with social protection measures to improve nutrition and strengthen resilience for the attainment of household food security. This will need to be mainstreamed into food and nutrition security programming in order to achieve SDG #2 which is hinged on eliminating hunger and all forms of malnutrition.

2.11.3. COVID-19 and nutrition in the context of Zimbabwe

The Corona Virus Disease 2019 (COVID-19) pandemic is a health and humanitarian crisis threatening the food security and nutrition of millions of people around the country [57]. The pandemic comes at a time when approximately 5.5 million and 2.2 million people in rural and urban areas were “cereal food insecure”, respectively [15]. In addition, the prevailing travel restrictions and lockdown measures adopted by the GoZ to control or mitigate COVID 19 outbreaks are affecting the food supply chains and livelihoods of many families across the nation. The continuous increase in food insecurity, coupled with high

food prices, may negatively affect the nutritional needs of vulnerable children and pregnant and lactating women. Except for immediate action is taken, there is a risk of people failing to meet their basic survival needs. Therefore, there is an urgent need to scale up nutrition and social protection programs targeting vulnerable households. On the contrary, a recent study also observed that COVID-19 lockdown can also increase the risk of overweight and obesity in affluent households as a result of reduced physical activity, consumption of less diverse foods, and increased food prices [57]. However, there are still a lot of unknowns concerning the COVID-19 pandemic and its impact on food and nutrition security in Zimbabwe and other African contexts.

3. Conclusion

Although the GoZ and partners have realized great strides to address these problems through a multisectoral approach, most nutrition indicators remain worrisome. The leading forms of malnutrition include stunting, wasting in children younger than 5 years, and micronutrient deficiencies (Vitamin A, iron, Zinc) affecting mostly young children and women aged 15-49 years. There is a glaring lack of nutrition data on school age and adolescence. In addition, there is evidence of an evolving nutrition landscape in Zimbabwe "nutrition transition" that is associated with an emerging problem of obesity and associated NCDs, diabetes mellitus, hypertension, and several cancers more prevalent in urban areas when compared to rural areas.

Therefore, the multiple burden of malnutrition is a crucial issue of public health concern sometimes existing at individual, family, and community levels and thus calls for the strengthening of the GoZ led multisectoral response. The declining socio-economic situation in Zimbabwe is contributing to an increase in acute malnutrition and food insecurity in poor urban and rural households. Recently, the restrictions associated with the containment of the COVID-19 pandemic are compounding the situation and more households will become vulnerable requiring food assistance and/or cash transfers. The review showed that the country has a supportive policy and institutional framework to address the growing burden of malnutrition. Unfortunately, there still exists a bias towards nutrition-specific interventions and thrust to address undernutrition that is predominant in rural areas with less emphasis given to the emerging problem of over nutrition affecting urban communities.

Considering that Zimbabwe's economy is agriculture-based, there is a need to put emphasis on promoting nutrition-sensitive agriculture initiatives through educating farmers to promote diversified agricultural production which has subsequent benefits of creating nutritious food systems. In addition, it is crucial for GoZ to urgently implement the FBDGs for Zimbabwe as a nutrition education tool that will drive the adoption of healthy lifestyles and dietary behaviors.

4. Recommendations

Programming and Policy

- It is important to come up with urgent social safety nets or the gains in the nutrition sector will be reversed by the COVID-19 pandemic and the prevailing economic crisis. In addition, socio-cultural and religious nuances will need to be considered in formulating nutrition programs;
- Multisectoral approach to tackle the multiple burden of malnutrition requires the interplay between nutrition-sensitive and specific programs for sustainable impact. The development partners should continue to support national efforts addressing the multiple burden of malnutrition towards the achievement of the SDDs by 2030;
- Regarding COVID-19 food and nutrition assistance should be at the heart of social protection programs. We need to protect food access for the most vulnerable by increasing their purchasing power through cash transfer projects and where necessary by directly providing food through community-based programs;
- The scaling up of the multi-sectoral community-based model for addressing food and nutrition insecurity should be hinged on a clear understanding of issues like gender, equality, climate change, water, sanitation, and hygiene (WASH) as these have an effect on the adoption of optimum breastfeeding and IYCF practices in LMICs settings;
- The GoZ should prioritize increasing budgetary allocations for nutrition-sensitive as well as nutrition-specific programs. This is critical for effective and sustained implementation of evidence-based nutrition actions. This will need to be coupled with building capacity, the functionality of food, and nutrition security committees at the district, ward, and village levels.

Research and surveillance

- Overall, the role of academia and nutrition surveillance cannot be overemphasized as empirical evidence and real-time monitoring system data is imperative to support evidence-based policy and programming decisions and allows the tracking of progress towards achievement of national and global target;
- There is need for the inclusion of adolescent nutrition indicators (10-19 years) in national surveys and for academia to generate empirical evidence to inform policy and program decisions;
- Studies that explore the gender and other socio-cultural determinants of malnutrition and poor breastfeeding and IYCF practices are recommended;
- The assessment of the efficacy and effectiveness of gender-specific public health nutrition interventions are required;

- Assessment of actual and usual dietary intake of various population groups is critical for informing finalization of the FBDGs for Zimbabwe and other policy actions;
- Studies that explore the scaling up and testing of heritage-based foods and their effects on health and other indicators are required.

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